MODIS AND DAO COORDINATION

September 6, 96

Al Fleig

I have just returned from a discussion with Dr. Rood which covered many aspects of interaction between the DAO and the MODIS team. Prior to distributing this message I sent a copy to Ricky for his review and he has confirmed that it does reflect our discussion accurately. This visit was in part motivated by a comment from Dr. King to Joanne Joiner at a recent meeting in Fairbanks that he, Mike, had some concerns about the lack of coordination between MODIS and DAO. In response to this concern the last paragraph of this note contains a suggested action item for each Discipline Team Meeting at the upcoming October Science Team Meeting. Drs. King, Esaias, and Justice need to decide whether to incorporate this in their meeting agenda in time for DAO to make adequate preparation.

The discussion was quite helpful and did identify some things that could be done to improve our interaction. Ricky explained that he currently is thinking that DAO should probably wait about six months for data from EOS instruments to shake out before starting to study it. DAO would then collect the data for perhaps a year and study it to determine the nature and statistics of the results and their errors before starting to assimilate it. There are also schedule questions relating to the availability of funds for computing and the development of their own programs which might make up to a year delay desirable. I suggested that the MODIS data would be in a reasonable format and probably at least as good as data from any other source shortly after launch and that there might be value to DAO to start earlier than that as it will take them some time to learn to read and understand our data and they could be doing that while we are improving our algorithms to make our data even better. Further I suggested that we hope to benefit from DAO's comments regarding the differences between our data and other data sources as we work to perfect our data. However we both recognized that programmatic issues, limited resources and the necessity to establish priorities may impact when they start to use MODIS data. However it was clear that MODIS is not suggesting that DAO delay its use of our data and that such a decision would be based on DAO's needs and not our plans to deliver data. (I stress this point because of a misinterpretation of a previous comment of mine that it would likely be several years after launch before we had made every possible correction to all of the MODIS data such that we had reached a final perfect set of algorithms for all products.)

Ricky commented that DAO had spent considerable effort developing a swath based output for their analysis in response to a MODIS need. He remembers Bob Evans commenting that if Bob had to do the time interpolation for sea surface temperature data he might as well use climatology. Now, after developing a swath output Ricky hears that MODIS may not intend to use it. More recently he has heard that we would not want his data unless it is provided in EOS-hdf format. He has no current plan to do that and does not know anyone else who does plan to do it. He has several questions, first, is this a MODIS requirement, and if so, why? Second whose responsibility is this if it is a requirement. (I am not currently aware of any MODIS Science Team Member who requires, or even desires, this but have not done an explicit survey.) Both of these are examples of requirements transfer by inference or osmosis rather than by formal request. In neither case was there a formal request from MODIS nor was DAO's response and its implications in terms of time or schedule clear to MODIS. It is very good that DAO is so concerned with our needs and so willing to try to be responsive but there are obvious problems with this approach.

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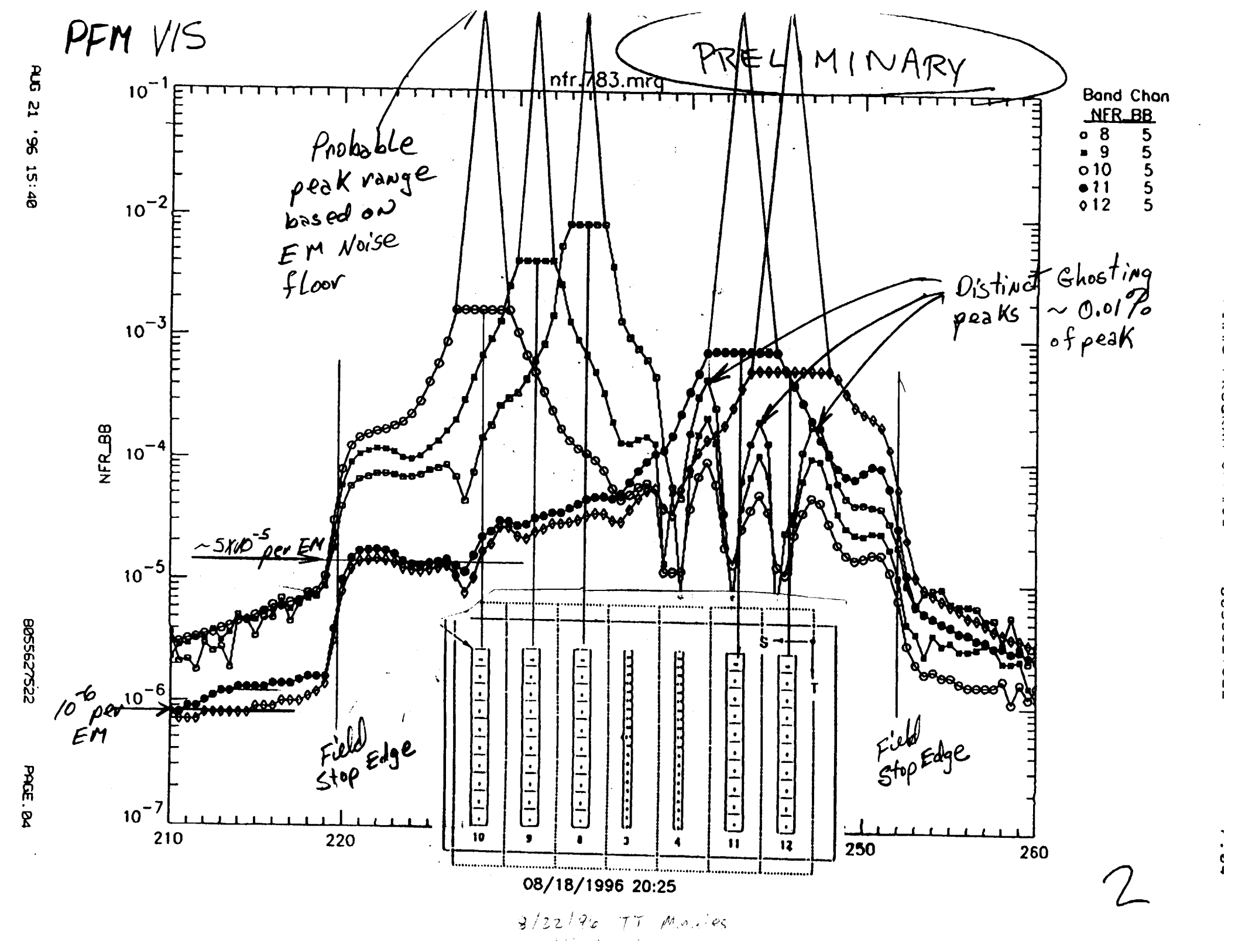
Attachment 1


PFM V/S
PRELIMINARY
nfr783.mrg
Band Chan
NFR BB
8 5
9 5
10 5
11 5
12 5
Probable peak range based on EM Noise floor
Distinct peaks
Ghosting ~ 0.01% of peak
NFR_BB
~5x10^-5 per EM
10^-6 per EM
Field Stop Edge
Field Stop Edge
S
T
10
9
8
3
4
11
12
08/18/1996 20:25
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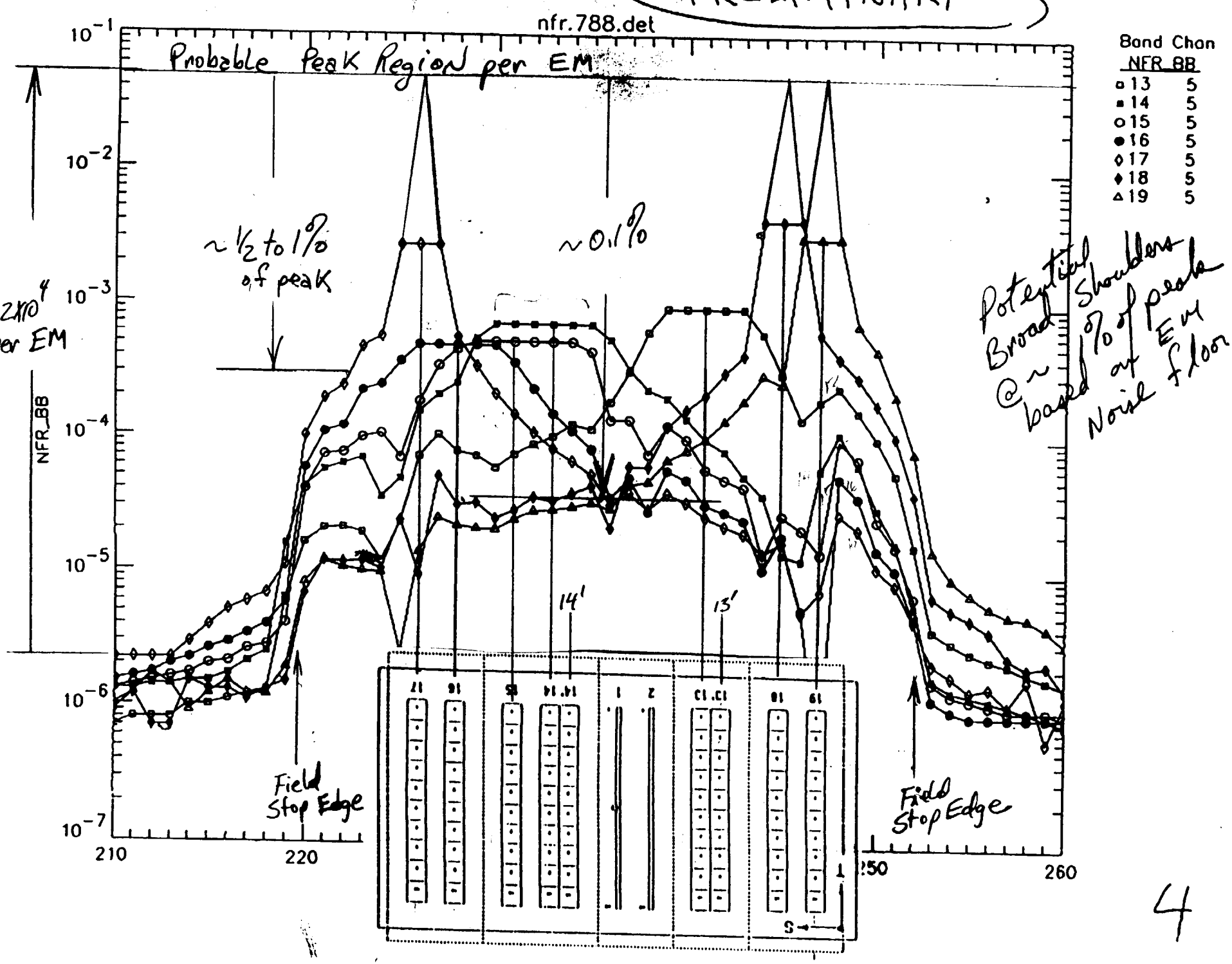
2
8/22/96 TT Mailes

PFM NIR

PRELIMINARY



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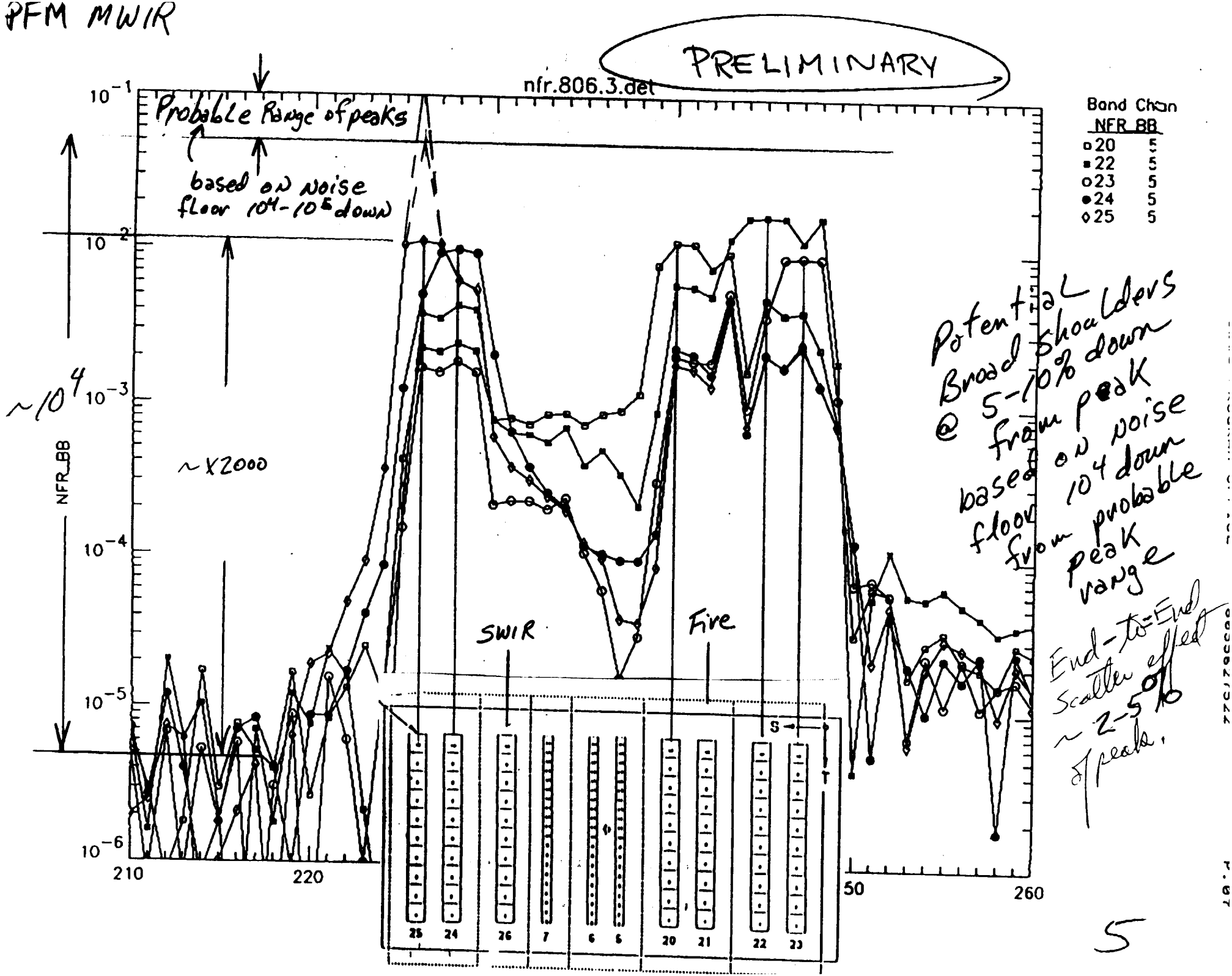
PFM MWIR


PRELIMINARY
nfr.806.3.det
Probable Range of peaks
based on noise floor 10⁴-10⁵ down
~10⁴
~X2000
NFR BB
10⁻¹
10⁻²
10⁻³
10⁻⁴
10⁻⁵
10⁻⁶
210
220
250
260
SWIR
Five
S
25 24 26 7 6 5 20 21 22 23
Band Chan
NFR BB
20 5
22 5
23 5
24 5
25 5
Potential Broad shoulders @ 5-10% down from peak based on noise floor 10⁴ down from probable peak range
End-to-End Scatter effect ~2-5% of peaks.
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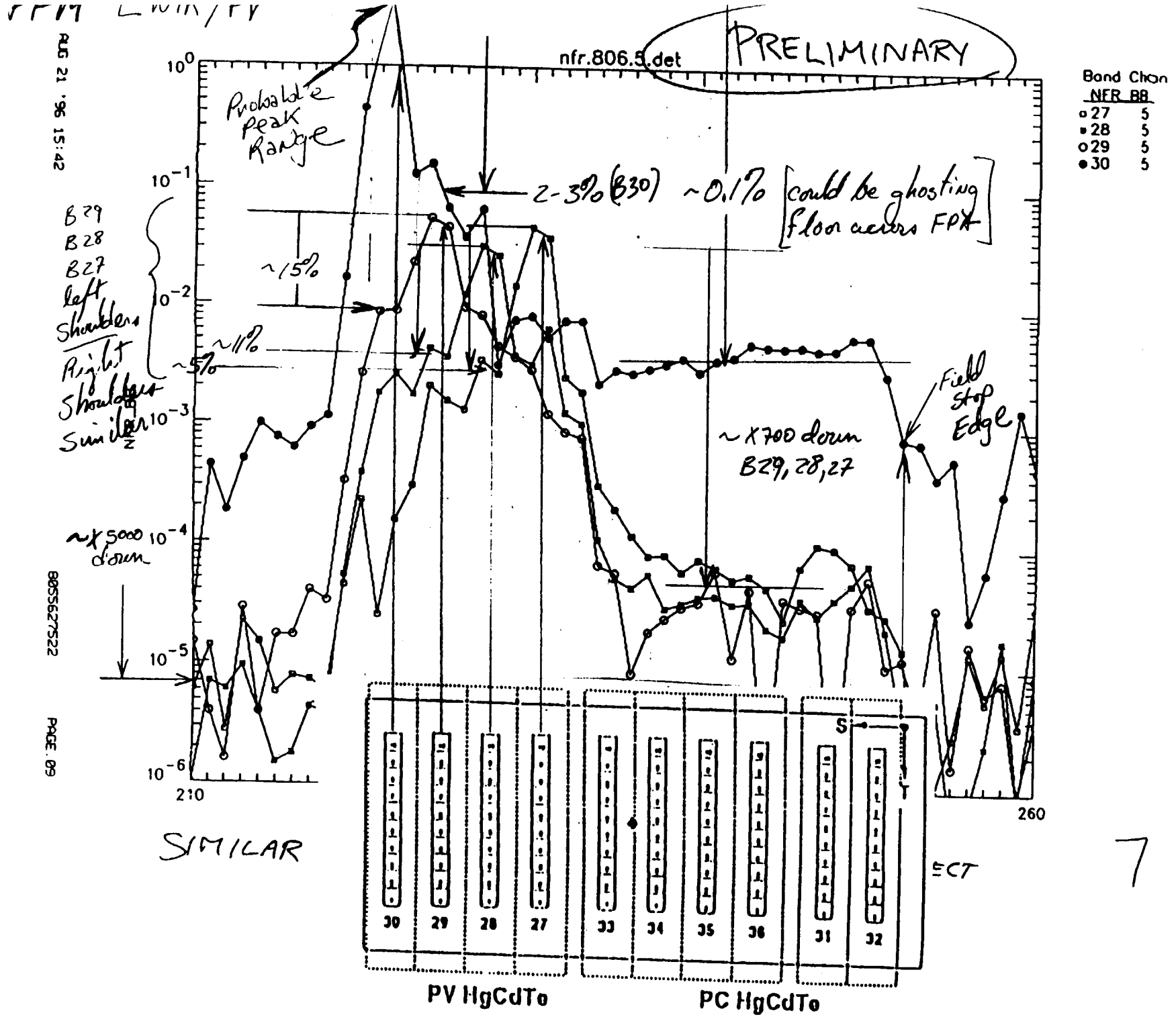
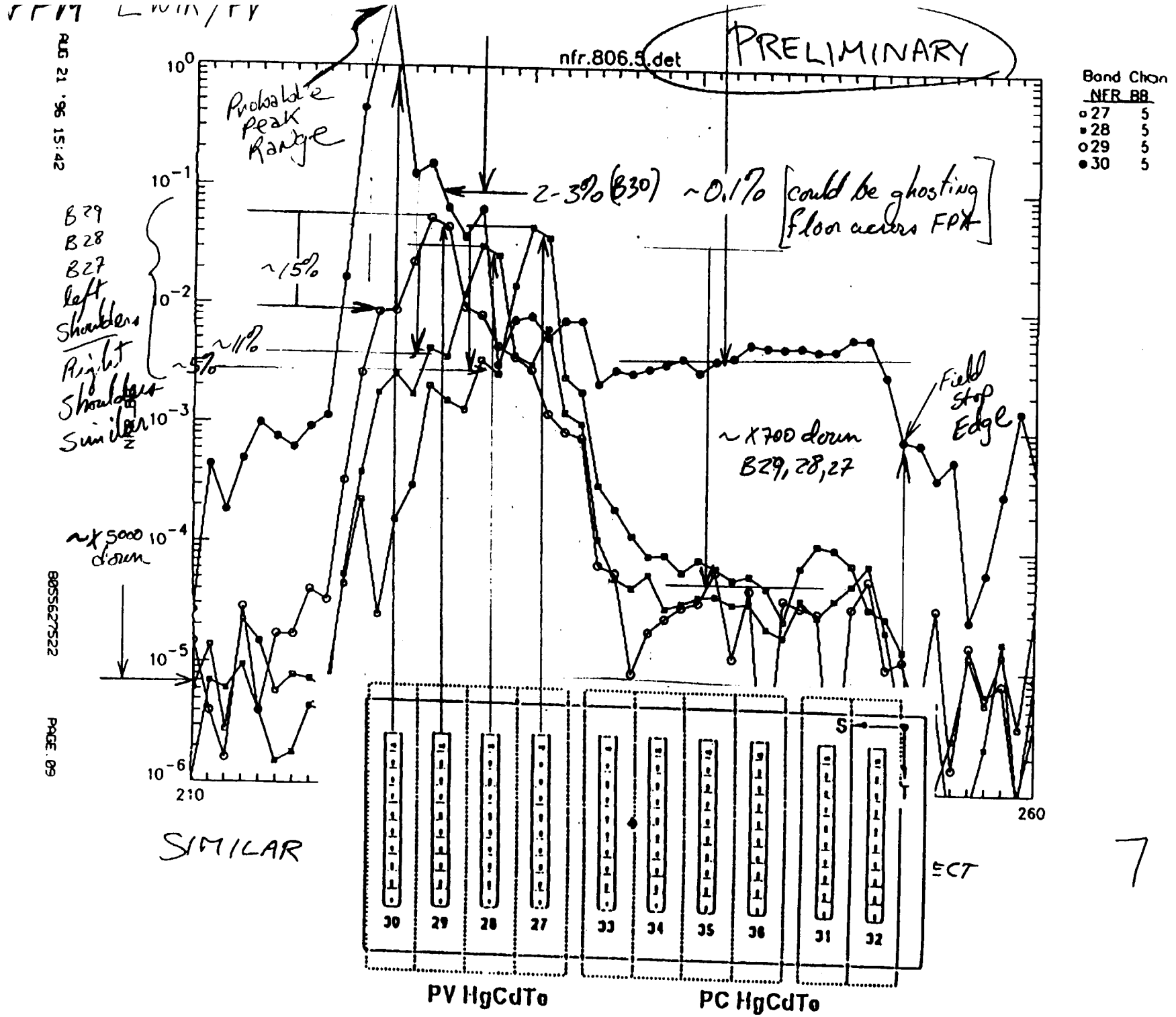

nfr.806.5.det
PRELIMINARY
Probable Peak Range
Band Chan
NFR BB
27 5
28 5
29 5
30 5
2-3% (B30)
~0.1% [could be ghosting floor across FPA]
~15%
~11%
~5%
B29
B28
B27
left shoulders
Right shoulders
Similar
~x5000 down
~x700 down
B29, 28, 27
Field Stop Edge
210
260
SIMILAR
ECT
30
29
28
27
33
34
35
36
31
32
PV HgCdTe
PC HgCdTe

7


nfr.806.5.det
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left shoulders
Right shoulders
Similar
~x5000 down
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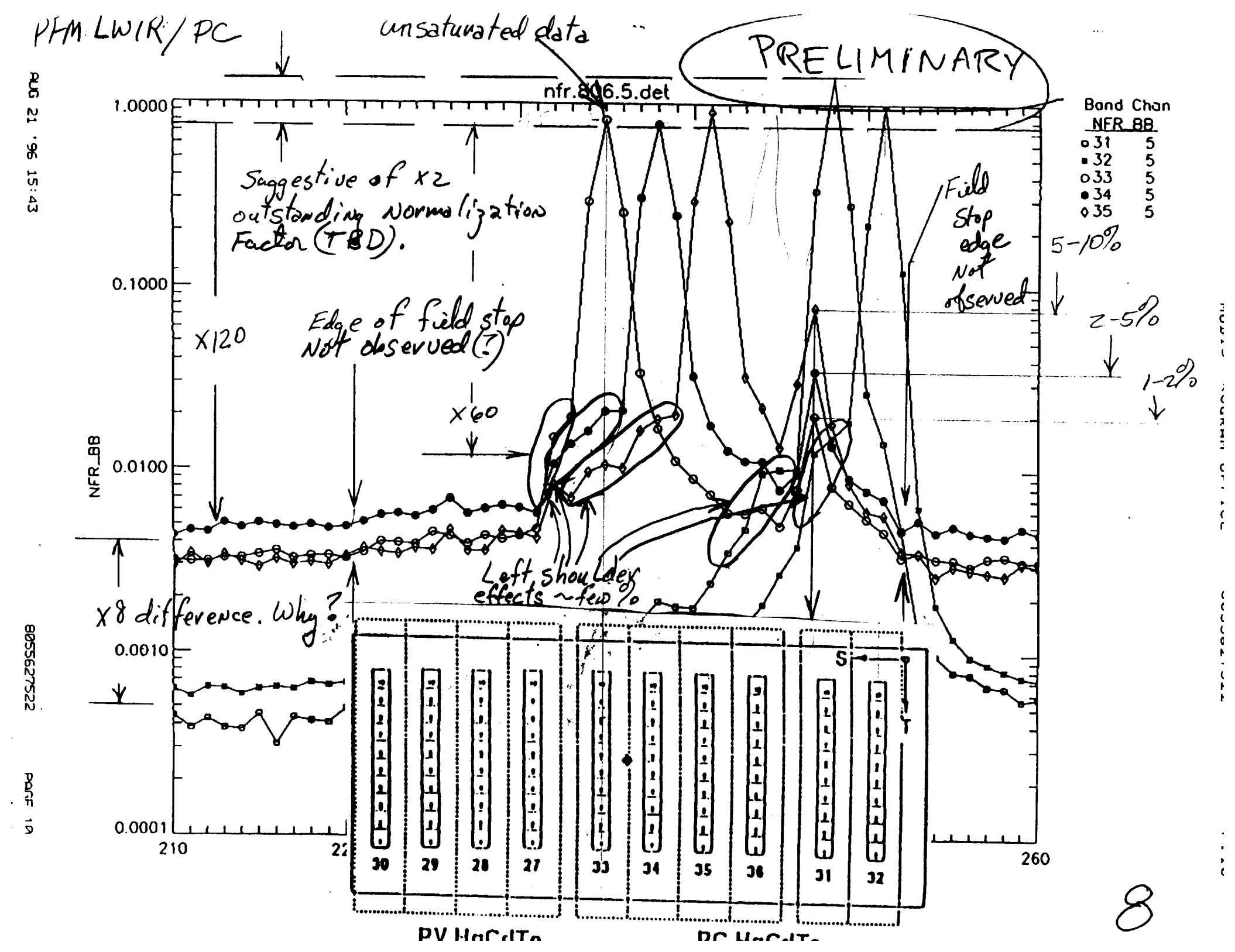
B29, 28, 27
Field Stop Edge
210
260
SIMILAR
ECT
30
29
28
27
33
34
35
36
31
32
PV HgCdTe
PC HgCdTe

7


PFM LWIR/PC
unsaturated data
PRELIMINARY
nfr.806.5.det
Band Chan NFR_BB
31 5
32 5
33 5
34 5
35 5
1.0000
0.1000
0.0100
0.0010
0.0001
NFR_BB
Suggestive of x2 outstanding Normalization Factor (TBD).
X120
Edge of field stop Not observed (?)
X60
X8 difference. Why?
Left Shoulder effects ~few %
Field Stop edge Not observed
5-10%
2-5%
1-2%
210
260
30
29
28
27
33
34
35
36
31
32
S
T
PV HgCdTe
PC HgCdTe
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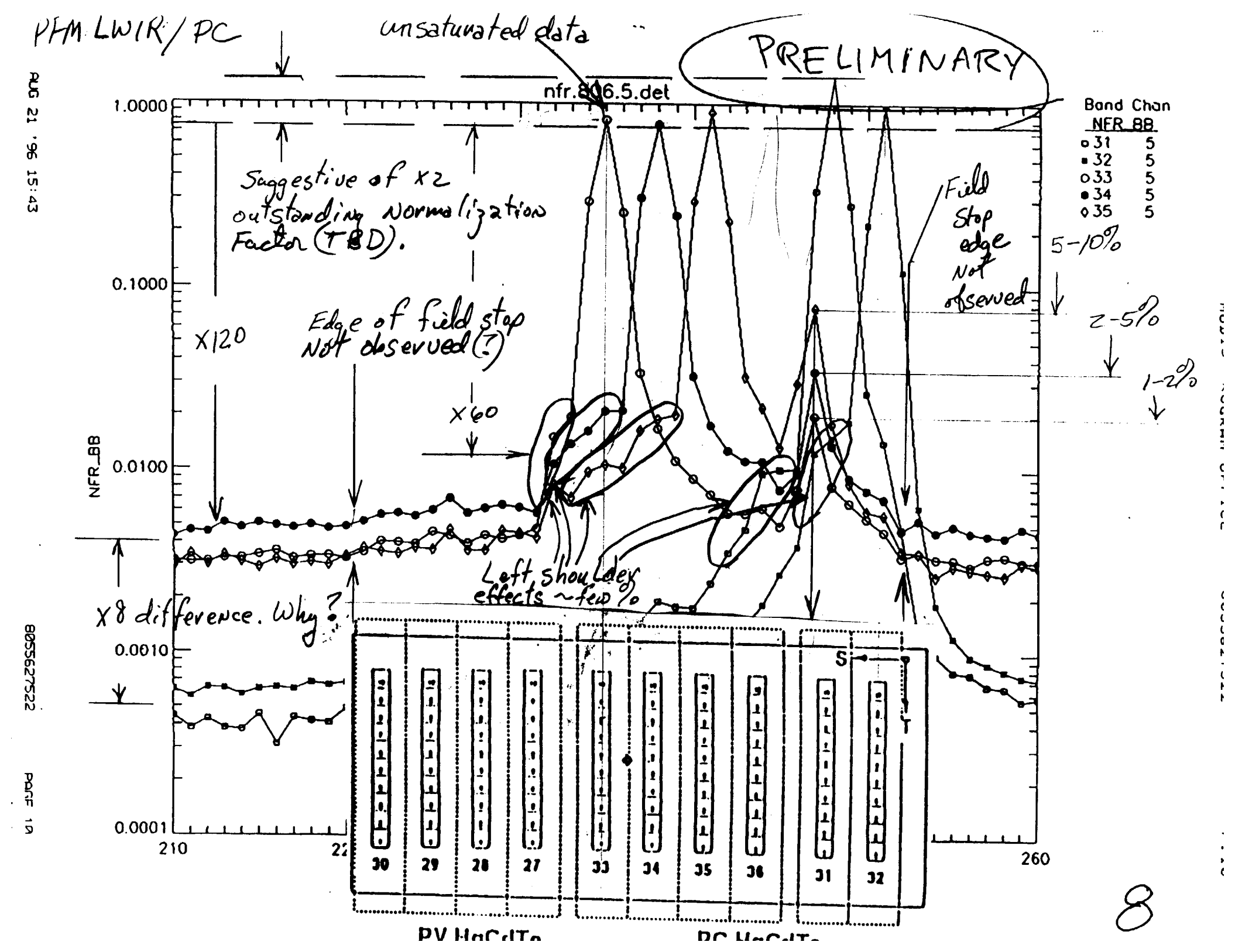
PFM LWIR/PC
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PRELIMINARY
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Band Chan NFR_BB
31 5
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260
30
29
28
27
33
34
35
36
31
32
S
T
PV HgCdTe
PC HgCdTe
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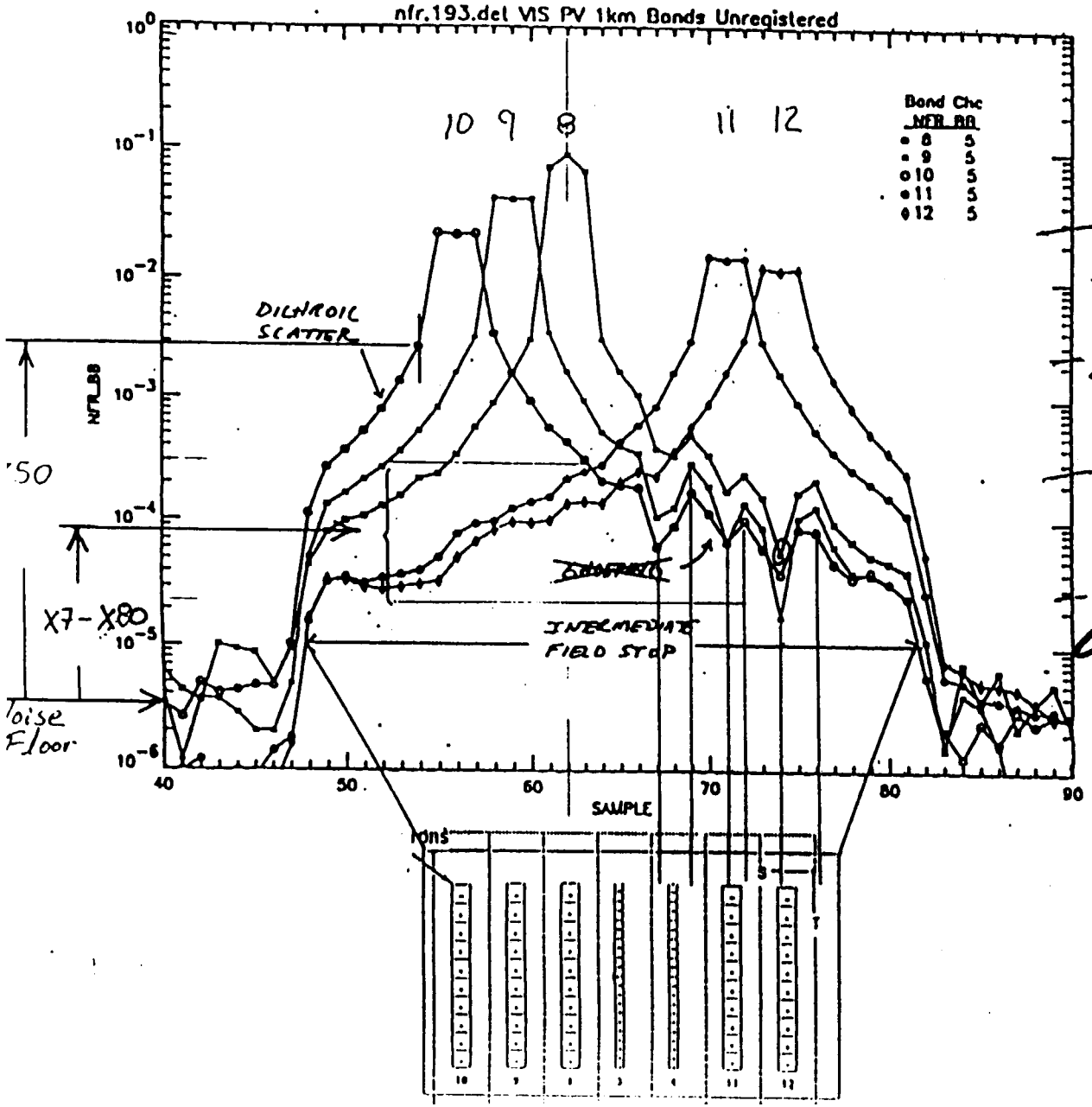
EM

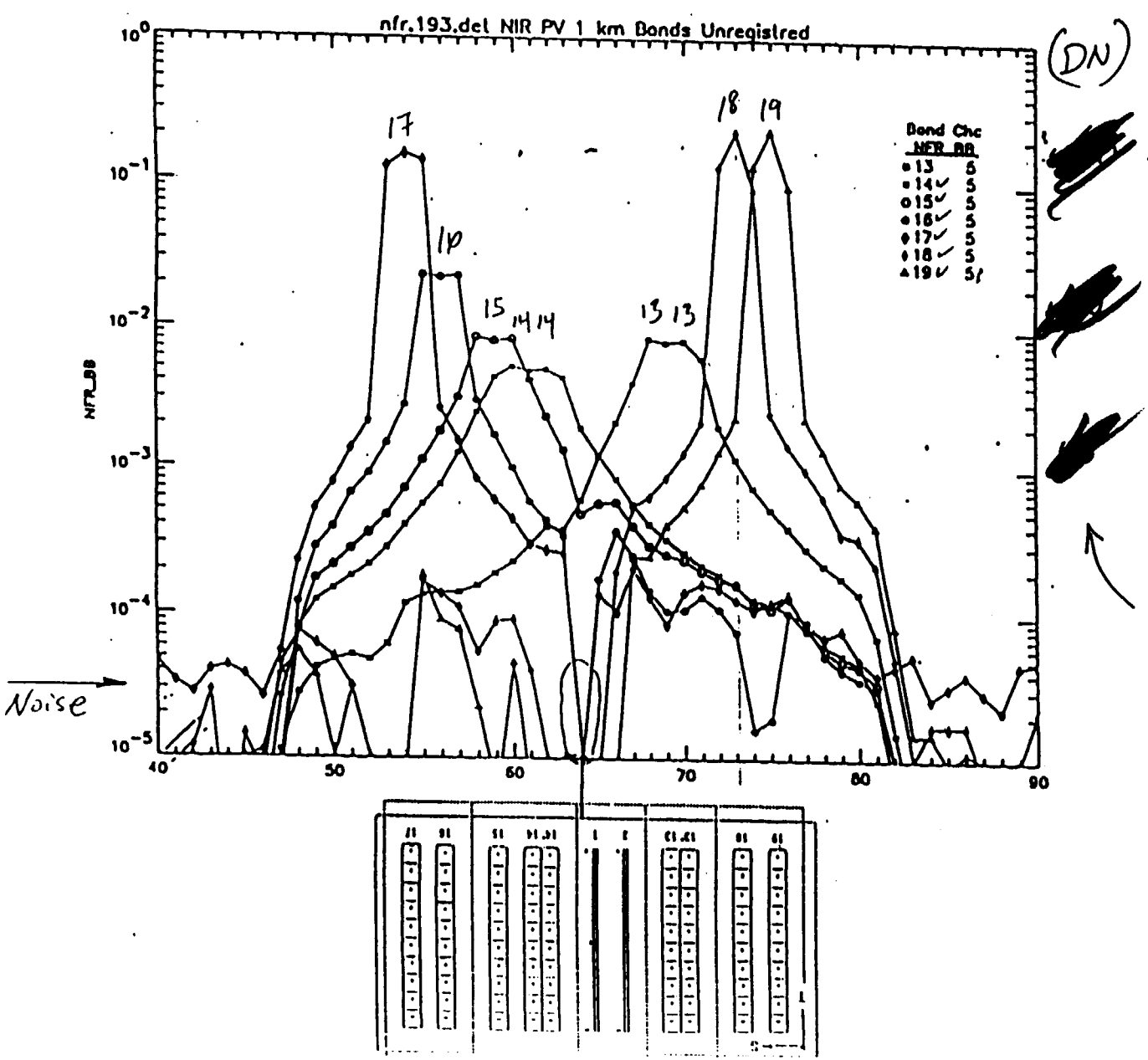
VIS (1 KM Bands 10, 9, 8, 11 and 12)



- Noise floor @ ~ 10^{-5} to 10^{-4}
- Near Field Scatter Wings: 10^{-3} to 10^{-4}
- Marked drop offs correspond to Field Stop
- Structure @ ~ 10^{-4} indicates low level ~~ghosting~~ corresponding to center locations of the filters

Depends on where Lmax is set w/r/t saturation

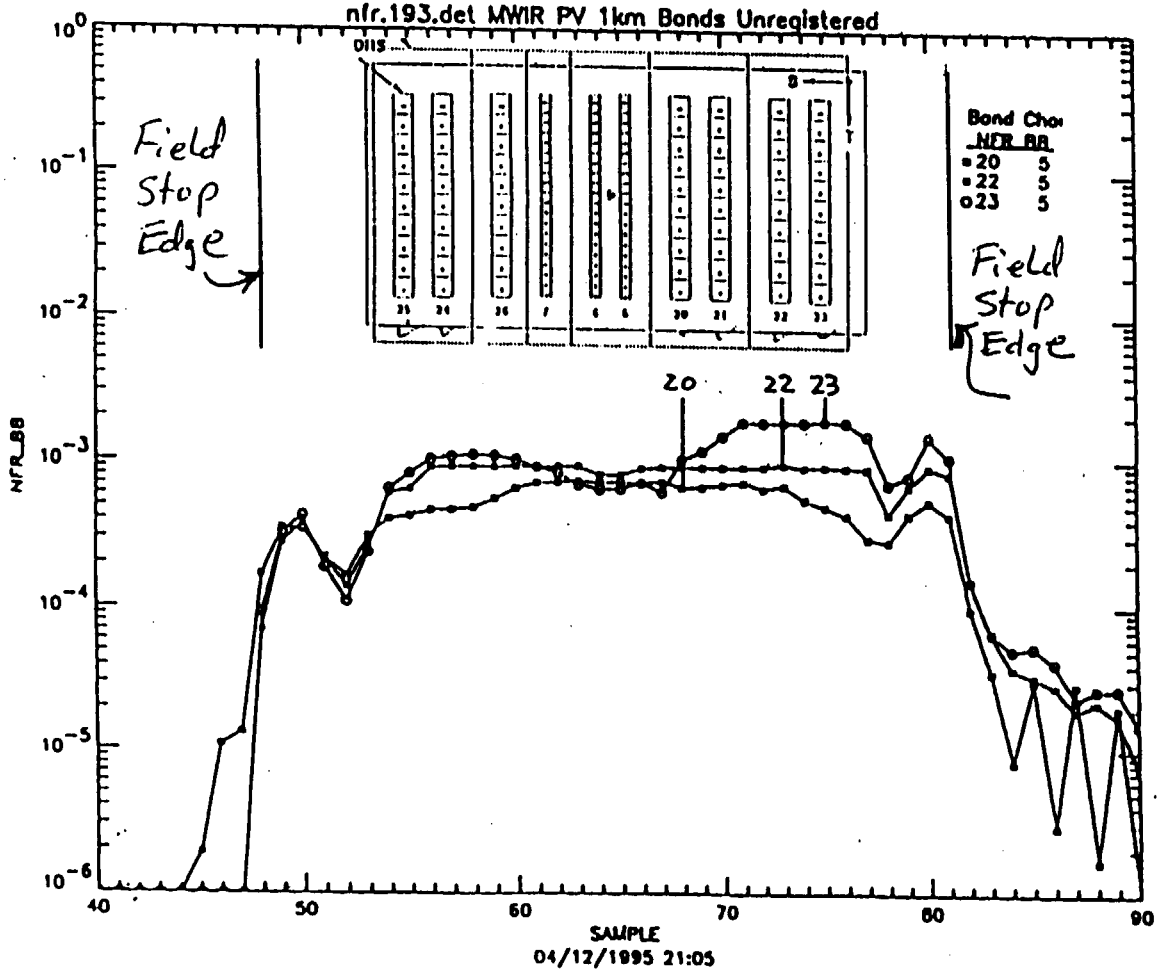
EM NIR (1 KM Bands 17, 16, 15, 14, 13, 18, and 19)



- Similar results to VIS Bands
- Near field scatter wings: 10^{-3} to 10^{-4} due to Dichroic #1 scatter
- Small dip, on the order of 10^{-4} at sample 64, probably due to Bands 1 and 2 filter characteristics

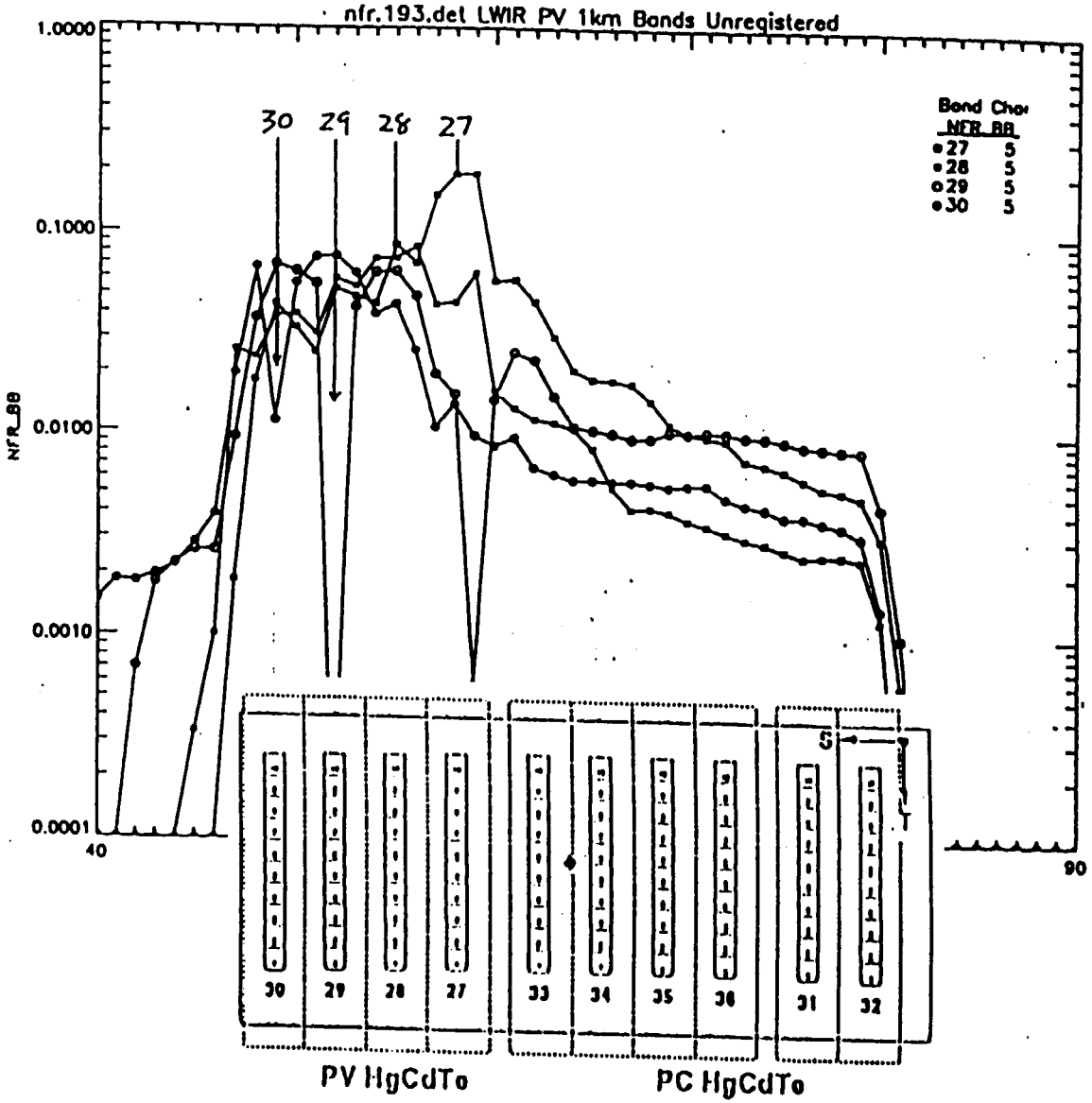
Depends on where L_{max} is set w/r/t saturation

S/MWIR (Bands 23, 22 and 20)



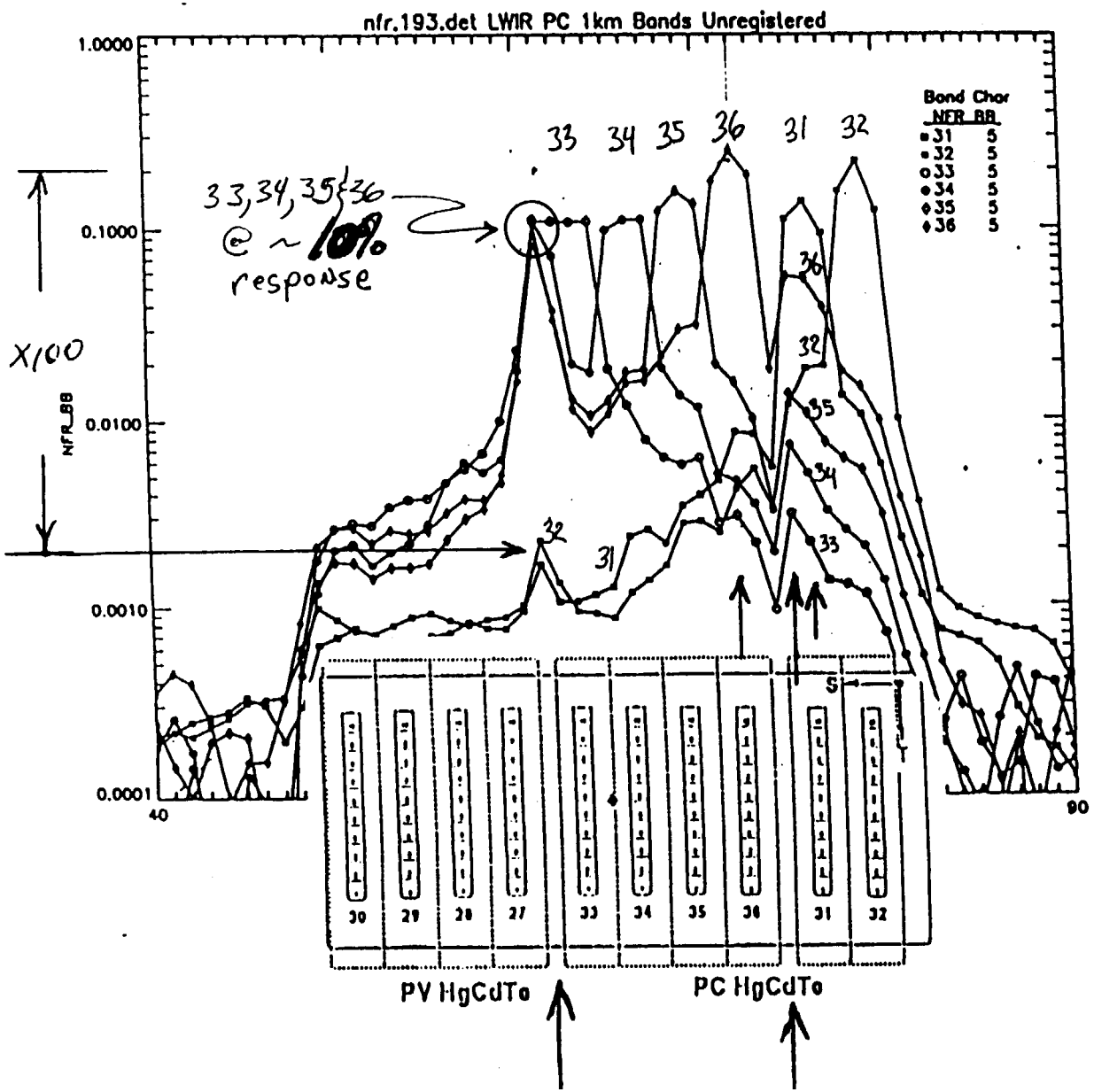
- Data acquired on Bands 5, 6 and 7 (not shown) indicate significant ringing due to sample offset non-uniformity. Band 6 has insufficient signal due to improper bandpass filter.
- Signal levels were roughly 1000 times the saturation levels.
- Uncertain if the wings are also saturated.
- Bands 24 and 25 were heavily saturated by the background radiation.
- Band 26 data was not collected due to GSFC filter change request resulting in insufficient dynamic range for near field response collection
- Band 21 data not acquired because it could not be illuminated with enough input.

EM LWIR (PV Bands 30, 29, 28 and 27)



- Signal levels ~ factor of 10 above scatter background.
- Majority of near field region is unsaturated.
- Flat scatter background response extends to the field stop limits.
- Bands 29 and 30 peaks drop out due to saturation.

EM LWIR (PC Bands 33, 34, 35, 36, 31 and 32)



- Scatter response extends to field stop location
- Dip around sample 74 corresponds to the region between the PC Bands 31 and 32 and PC Bands 33 to 36, which are on different substrates.
- Signal spike at sample 61 is ~10% of the peak signal and occurs at the transition between the PV and PC Bands.
- Bands 33, 34, 35 and 36 show response at location of Band 31.